HEALTH PHYSICS SOCIETY

"Specialists in Radiation Safety"

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Dr. Lawrence S. Cardman, Chair
Nuclear Science Advisory Committee Isotopes Subcommittee
Associate Director for Experimental Nuclear Physics
Jefferson Lab
12000 JEFFERSON AVE, STE 6
Newport News, VA 23606-4468

Dear Dr. Cardman,

HEALTH PHYSICS SOCIETY RESPONSE TO YOUR REQUEST FOR INPUT TO THE NUCLEAR SCIENCE ADVISORY COMMITTEE ISOTOPES SUBCOMMITTEE

The Health Physics Society (the Society) represents more than 4,500 scientists, engineers, university professors and researchers, technologists, administrators, and other professionals engaged in the science and practice of radiation safety. We speak for a large isotope user-community with diverse isotope needs for various applications in science, medicine, and industry. We also represent affiliate member companies engaged in several aspects of radioisotope production, sales, and use for a broad spectrum of beneficial nuclear science and medical applications. In response to your request, we offer the following comments.

In January 1992, the Society issued a position statement, "Compatibility in Radiation Safety Regulations," which was most recently reaffirmed in July 2007. This statement calls for a single, independent U.S. federal agency to have responsibility and authority to establish all ionizing radiation safety standards. While not directly applicable to the isotope production programs, much of the reasoning behind the position statement still has relevance to these programs.

The position statement was motivated by the fractionated regulatory framework that exists in the United States for regulating ionizing radiation, and notes that this framework is inconsistent, inefficient, and unnecessarily expensive, and calls for a single U.S. federal agency to hold the ultimate responsibility. Similarly, the current organizational structure governing isotope production at the Department of Energy (DOE) is also highly fragmented. The Office of Nuclear Energy has responsibility for space isotopes; the National Nuclear Security Administration has responsibility for limiting the proliferation of highly enriched uranium-235 needed for molybdenum-99 production and other medical isotopes; the Office of Environmental Management has responsibility for getting rid of legacy radioactive materials that could be used beneficially by others; and the Office of

Science distributes various stable isotopes, and produces radioisotopes for sale (mainly germanium-68, strontium-82, cobalt-60, and californium-252, among others).

A highly fragmented division of responsibility for isotope production at DOE, distributed among four different DOE offices may result in poor coordination, mission overlap, and other inefficiencies that may lead to an inability to provide isotopes cost-effectively to, and in quantities needed by, potential customers for critical national needs. Where conflicting missions exist, it may lead to unproductive (or even detrimental) competition between programs and, increase the probability of inefficiency (such as the inability of the Idaho National Laboratory to use its reactor efficiently for plutonium-238 production, since major costs of operation are provided by the U.S. Navy). Ultimately, the responsibility for leadership, coordination, and scientific planning rests with the Administration and Secretary of Energy; however, your subcommittee could identify coordination problems where they exist, and help DOE work to achieve better overall solutions.

Society members are also concerned about recent down-blending for disposal activities by the Office of Environmental Management that have resulted in a missed opportunity to preserve and provide americium-241 to the oil exploration industry; this may result in the industry seeking this isotope from foreign providers that may not have the same high safety and security standards for isotope production and source manufacture as those in the United States. Furthermore, it appears DOE has preferred down-blending of uranium-233 to be an acceptable disposal pathway without recovering the thorium-229 content. Thorium-229 is a potential source for much-needed actinium-225, currently used in the research and development of alpha-particle immunotherapies for the treatment of advanced cancers.

What is the user community's most important priority?

As you are undoubtedly aware, there are 15 – 17 million diagnostic nuclear medicine procedures performed per year in the United States, using technetium-99m as the imaging agent. Technetium-99m is procured from its parent nuclide molybdenum-99, yet today there is no domestic supply of molybdenum-99, nor does the United States have the associated radiochemical processing facilities. While the National Nuclear Security Administration has supported alternative and speculative (non-reactor) technologies, it does not appear these technologies would be able to effectively compete with the reactor-produced molybdenum-99 currently supplied by Canada, Belgium, and The Netherlands, both because the anticipated yield will be lower, and the production costs will be higher than the foreign competition. Russia, Australia, South Africa, South Korea, and even Poland have developed or are developing self-sufficiency in molybdenum-99 production for technetium-99m, the most important radioisotope in diagnostic nuclear medicine. The United States nuclear medicine community is the major consumer of molybdenum-99 in the world. A national program focused on efficient and cost-effective domestic production capability for molybdenum-99 and iodine-131 could prevent future critical shortages.

How could the DOE Isotopes program better support our needs?

The Society's affiliate members have expressed concern about the high costs of, low availability of (in specific cases), and delays in obtaining some of the DOE-supplied radioisotopes. In some cases, this has resulted in turning to foreign suppliers for needed isotopes at more competitive prices. High pricing may also be exacerbated by DOE's full-recovery pricing policies for commercial isotopes. DOE may want to consider evaluating its pricing relative to foreign suppliers, and identify areas where DOE production costs may be reduced.

Thank you for the opportunity to comment on isotope production at the Department of Energy.

Sincerely,

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c: Darrell Fisher, Past President
Brett Burk, Executive Director